CONFIDENTIAL

File RD-91

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H-2061-ARA-12-55

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Old 10/20. 2500

26 August 1955

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ILLEGIB

Subject: H-2061

Three (3) copies of the revised technical proposal have been forwarded to you. The draft of the sub-contract with is nearing completion. However, it is proposed to start working on the project immediately on the supposition that approval will be granted and that minor discrepancies can be rectified while the work is progressing.

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A study of the patterns of the NRL horns proposed for use on this project brings to light the following information:

1. The "L" band horn (NRL-RA66D440) with or without aperture cover will barely meet the beamwidth specification at the high frequency end of the band for 6 db down.

2. The bands 8 and 9 NRL horns (AT-513(XB-1)/AIR and AT-630 (XB-1) /AIR) without ground plane or in a cylinder whose diameter is large compared to the wavelength will also barely meet the beamwidth specification at the high frequency end of the band for 6 db down.

3. For a beamwidth 3 db down, the "L" band horn is adequate only at the low frequency end of the band and the high band horns are adequate only over part of the frequency bands.

4. The high band horns have more than one nearly equal major lobe over the frequency band. These may be due to reflections or additional modes of operation. However, in the interest of minimizing the antenna development work, it is suggested that the horns be used as designed by NRL and that improvements of beamwidth and of more desirable pattern shapes be made a subject of future work. More details of apttern measurements are given in the Appendix.

2 sets

The NRL horn drawing RA66D440 (4 sheets) was made available for use in composing TP2.651, however, at the present time this drawing is unavailable. In order t: furnish with the maximum information, it is requested that another copy of RA66D440 be obtained.

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An investigation of phosphor types for the Tektronix oscilloscope reveals that the P1 type is the most suitable. This type gives the maximum brightness for manual viewing of pulses having fast rise time and for determining pulse width information. The P1 type can also be photographed without smear by normal photographic means. Other phosphor types are not suitable because of lack of visual brightness at high writing speeds.

Information has been obtained that the console unit and the auxiliary equipment will be mounted on a horizontal surface. Therefore, the work toward shock mounting this equipment is going on under this supposition.

Very truly yours

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sf
cc: [redacted] 25X1

APPENDIX

NRL Horn Beamwidths

"L" Band (RA66D440) Horn

Frequency	Polarization	Without Aperture cover 3 db	Without Aperture cover 6 db	with aperture cover 3 db	with aperture cover 6 db
1100 Mc	vert.	69°	103°	72°	102°
	hor.	91	140	87	133
1400	Vert.	75	101	71	108
	hor.	79	115	79	113
1800	vert.	66	91	64	89
	hor.	66	91	66	93
2200	vert.	55	75	53	76
	hor.	55	75	53	76

AT-513 (XB-1)/ALR Horn

Frequency	Polarization	No gnd. plane 3 db	No gnd. plane 6 db	8½" dia. cyl. @45° 3 db	8½" dia. cyl. @45° 6 db
10.2 Kmc	vert.	68°	98°	70°	114°
	hor.	119	187	116	167
13.3	vert.	82	105	62	84
	hor.	106	135	90	138
16.7	vert.	54	80	51	77
	hor.	99	124	77	115
19.6	vert.	53	75	49	72
	hor.	85	108	72	98

AT-630 (XB-1)/ALR Horn

Frequency	Polarization	No gnd. plane 3 db	No gnd. plane 6 db	8½" dia. cyl. @45° 3 db	8½" dia. cyl. @45° 6 db
21 Kmc	vert.	74°	100°	82°	112°
	hor.	118	146	122	151
25	vert.	80	104	87	100
	hor.	58	109	75	150
29	vert.	62	84	69	85
	hor.	42	137	79	136
34	vert.	74	94	66	88
	hor.	83	114	78	105
39	vert.	64	85	52	83
	hor.	64	76	62	92